

REMARKS

By requesting the above amendment, Applicants amend previously presented claims to narrow their scope so as to overcome the technical rejections and define the invention more particularly and distinctly over the prior art.

Claim Objections

The last O.A. stated that claim 26 was objected to because the language used made it unclear if the planar reflectors are the part of or in addition to the reflective surfaces set forth in independent claim 19. Applicants considered Examiner's suggested guidelines for correcting the claim language (p. 2, first paragraph). Accordingly, claim 26 was rewritten as new claim 39 using the suggested language. Claim 39 now particularly recites "wherein at least one of the linear mirrored surfaces comprises a composite of linear planar reflectors extending parallel to said mirrored surfaces and having the same basic orientation thereby forming said generally concave transversal profile". Applicants kindly request the withdrawal of the corresponding objection.

Claim Rejections – 35 USC § 102

The rejection of claims 19-25, 27, 28, 30-32 and 34-36 under 35 U.S.C. §102(b), as being anticipated by York 4347834 is respectfully traversed.

Applicants fully considered the Examiner's remarks stating that the reflectors of York may be considered as being "elongated" relatively to a short(er) reflector and that "elongated" does not mean "linear" or "straight" (p.5, first paragraph).

Applicants submit that the term "elongated" was replaced with term "linear" in independent claim 19 and dependent claims 20-22,25-28,30, and 36-39 to further limit the scope of claimed features and more particularly recite the linear structure of the energy collecting and converting apparatus. The specification of the present invention fully supports these features and discloses an energy concentrator comprising a plurality of slat-like elongated/linear reflectors (see, e.g., paragraph [033] and Figs. 1, 5, and 6 in the application). Clearly, "linear" reflectors are completely foreign to York who shows cylindrically shaped frusta representing uninterrupted annular surfaces (col. 4, l. 5 and Fig. 1).

Dependent claims 20-25, 27, 28, 30-32, 34-36 (as amended), and 39 (new) include all the subject matter of claim 19 and add additional matter and limitations which makes them independently novel and patentable over York.

Thus, for the above reasons, Applicants request reconsideration of this rejection.

Claim Rejections – 35 USC § 103

The rejection of claims 19-28 and 30-36 as being unpatentable under 35 U.S.C. §103(a) over Popovich 4337759 in view of York is respectfully traversed.

As stated above, independent claim 19 has been amended to define patentably over York. Also, claim 19 is patentable over Popovich in view of York since it would have been impossible to combine the conical frusta of York with straight and planar facets of Popovich to obtain all novel features of the present invention, particularly the structure composed by linear mirrored surfaces having concave transversal profiles.

Additionally, claim 19 has been amended to further narrow its scope and recite “mirrored” surfaces which reflect the incident radiation by means of a single “specular” reflection so as to overcome this technical rejection and define patentably over Popovich in view of York, or any combination thereof.

The limitation of employing the mirrored surfaces with specular reflectivity implies the use of a layer of specularly reflective material in the reflector structure. The present specification specifically recites the use of mirrored surfaces and teaches how to make such reflectors, as well as shows some examples of mirrored surfaces (paragraphs [033], [034], and [037]).

The device shown in Popovich employs the Total Internal Reflection (TIR) on the boundary between two refractive media during the energy’s internal passage through the refractive element (col. 2, l. 12-18) which precludes the use of a mirrored material reflecting specularly. Also, TIR will not take place unless the incident light is traveling within the more optically dense medium towards the less optically dense medium and unless the incidence angle is greater than Brewster’s angle. Popovich does not teach and neither he is aware of the use of mirrored surfaces with specular reflectivity to direct the

incident radiation in the novel manner proposed regardless of the angle of incidence and the optical density of the reflector's material.

The device of York shows conical frusta made of a reflective material (see, e.g., col. 3, l. 35-43). However, neither York suggests combining his reflectors with refractive media using the TIR effect for reflection nor will this combination produce the intended results. In other words, if any of the TIR surfaces in Popovich device is converted to a mirrored surface, this surface will immediately lose its TIR properties thus departing from the scope of Popovich's system. Furthermore, the nested reflectors of York's system are shaped as uninterrupted conical frusta defined by single and unique parabolas having a common point focus. Therefore, they cannot be used as the linear reflective surfaces extending parallel to each other and working in the manner proposed.

Thus, applicants submit that the novel physical features of claim 19 are also unobvious and hence patentable under §103 since they produce new and unexpected results over Popovich and York. The new and unexpected results are the ability of applicant's system to direct the incident radiation to a common linear focus by a plurality of linear concave reflectors using a single specular reflection.

Dependent claims 20-28 and 30-36 incorporate all the subject matter of claim 19 and add additional matters which, in combination with novel and unobvious features of claim 19, makes them a *fortiori* and independently patentable over Popovich and York, or any combination thereof.

The last O.A. stated (p.3, last paragraph) regarding claim 26 that composite curved reflective surfaces made of individual planar elements are well known in the art. It also stated regarding claims 37 and 38 (p. 4, first paragraph) that means for individually supporting reflectors in the proposed manner is well known in the art, and modifying the reflectors of Popovich in view of York accordingly would have been obvious at the time of invention to provide increase flexibility/adjustability in positioning of the reflectors.

Applicants submit that, as stated above, the novel physical features of claim 19 (as amended) are unobvious and hence patentable under §103. Thus, dependent claims 26, 37, and 38 in combination with novel and unobvious features of claim 19 are also patentable over Povovich in view of York or any prior art reference. No prior art shows the radiant energy collector composed by linear mirrored

surfaces having curved profiles and directing the incident radiation to a plurality of converging directions through spaces between the adjacent surfaces by means of a single specular reflection. The more specific types of transversal profiles recited in claims 26, 37, and 38 yet further limit the scope of independent claim 19 to simplify the fabrication of mirrored surfaces and thus, in combination, are also producing novel and unexpected results.

The rejection of claims 26 and 33 as being unpatentable under 35 U.S.C. §103(a) over York is also respectfully traversed.

The last O.A. stated (p. 4, l. 13-17) that the use of reflectors having a circular profile or composite curved profile consisting of planar segments would have been obvious at the time of invention since these types of surfaces are easier to manufacture versus non-spherical curved surfaces.

Applicants respectfully submit that, in view of independent claim 19 (as amended) defining patentably over York, dependent claims 26 (rewritten as new claim 39) and 33 are a fortiori and independently patentable over this reference. Claims 26 and 39 define much more than just circular or composite profiles which are well known in the art. These claims incorporate all the novel and unobvious subject matter of claim 19, particularly, the linear, concave-profile reflective surfaces which are not taught by York.

Applicants also submit that the fact that employing circular or composite planar profiles produces advantages, such as the ease of manufacturing, militates in favor of Applicants because it proves that the combination of these features and the system of claim 19 produces new and unexpected results and hence is unobvious.

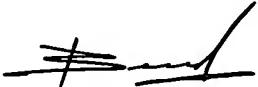
Conclusion

In view of all the foregoing reasons, applicants respectfully submit that the claims are now in the proper form and this application is in condition for allowance, and such allowance is therefore kindly requested.

Respectfully submitted,



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Date November 12, 2004, Signature 

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